

MONTHLY PROGRESS REPORT NO. 9
THERMOELECTRIC BONDING STUDY
NASA Contract No. NAS5-3973

Covering Period from 1 April through 30 April 1965

I. Accomplishments During the Period

A. Thermoelectric Element Test Fixture

Design of the test fixture has been completed and the drawings approved by the NASA technical representative. All components have been ordered and contracts have been let for all required outside fabrication. All components of the fixture not yet on hand are scheduled for delivery by 1 June.

B. Fabrication of Samples

Approximately 100 TEGS-3P (p-type PbSnTe) elements have been fabricated for preliminary property evaluation and for use in braze process optimization. Satisfactory correlation with property values reported by 3M has been obtained.

C. Optimization of Braze Process

Results to date indicate that the bonding process developed for p-PbTe is not completely satisfactory for p-PbSnTe. Work is underway to modify the braze cycle in order to obtain bonds comparable to those made with the p-PbTe material. Because of this it is likely that a short delay will occur in submitting the preliminary braze specification to the NASA technical representative.

II. Future Work

A. Construction of the test apparatus will continue.

B. Fabrication of test samples for bond evaluation and element test will continue.

C. Development of the bonding process will receive major attention.

III. Costs

A copy of the billing on this contract for the month ending 2 May is attached.

FACILITY FORM 602	N65-29779		GPO PRICE	\$	
	(ACCESSION NUMBER)	(THRU)	CFSTI PRICE(S)	\$	
	<u>2</u>	<u>1</u>			
	(PAGES)	(CODE)			
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HITTMAN ASSOCIATES, INC.
Baltimore, Maryland 21215

MAN 3402

Contract No. NAS5-3973

Voucher #11

Month Ending 5/2/65

<u>Element of Cost</u>	<u>TOTAL DOLLAR AMOUNT</u>	
	<u>Current Costs</u>	<u>Cumulative Costs</u>
Direct Labor	\$ 1,641.23	\$ 24,309.66
Overhead @ 117%	<u>1,920.24</u>	<u>27,454.75</u>
Total Direct Labor + Overhead	\$ 3,561.47	\$ 51,764.41
Materials and Other Direct Charges:	1,898.47	8,128.40
Travel	<u>17.64</u>	<u>135.81</u>
TOTAL COSTS	\$ 5,477.58	\$ 60,028.62
Fee @ 7%	<u>383.44</u>	<u>4,202.61</u>
TOTAL THIS BILLING	\$ <u><u>5,861.02</u></u>	\$ <u><u>64,231.23</u></u>